

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/24/2011 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 10 and 11 are dependent upon a cancelled claim (claim 9) and therefore is not examined.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4-8, and 12-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Prakash et al. (US 6444343, already of record, hereafter referred to as PRAKASH).

With respect to claims 1, 4-8, and 12-17, PRAKASH discloses a solid polymer electrolyte membrane for methanol fuel cell (as in claim 1, 12-17) comprising: polystyrene sulfonic acid blended with poly vinylidene fluoride (Applicant's polymer A and B, respectively, as in claims 1, 3-9) (col 5: ln 21-27, ln 36-42 and ln 51-52). The process of making of the solid polymer electrolyte in PRAKASH is similar to that of the present Application. The courts have held that "a compound and all its properties are mutually inseparable", *In re Papesch*, 315F.2d 381, 137 USPQ 42, 51 (CCPA 1963). Further, attention is drawn to MPEP 2112.01, which states that "products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present.", *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, it is the position of the examiner that the amount of unfreezeable water is inherently within the range disclosed by the applicant (as in claim 1) if the

polymer blends used in the prior art reference are comprised from the polymer compounds disclosed by the Applicant.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 4-8, 12-14, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by or in the alternative under 35 U.S.C. 103(a) as being unpatentable over Lafitte et al. (Macromol, Rapid communications, 2002, 23, 896-900, hereafter referred to as LAFITTE, already of record).

With respect to claims 1, 4-8, 12-14, 16 and 17, LAFITTE discloses a proton-conducting membrane (PEM) for DMFC (wherein fuel is inherently methanol) comprising sulfophenylated polysulfones with a non freezing water content of 81.3-100 wt% (page 898: scheme-1; page 899: Table 2)..

In the alternative that the disclosure by LAFITTE be insufficient to anticipate the instant claims, please note that as stated in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990), "in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists". (See also *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997)). Similarly, "a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same

properties". *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Therefore it would have been obvious for the person of the ordinary skill in the art to select the overlapping claimed range of unfreezable water from the range disclosed in the prior art reference because the prior art reference finds that the prior art composition in the overlapping disclosed range has a suitable utility. Also see MPEP § 2131.03 and § 2123.

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prakash et al. (US 6444343, already of record, hereafter referred to as PRAKASH) as applied to claims 1, 4-9 and 12-17 above, and further in view of Muller (US 6777116, hereafter referred to as MULLER).

With respect to claim 18, PRAKASH discloses direct methanol fuel cell (col 3: In 28-32) but does not expressly disclose water alcohol having a carbon number of 1-3 as the fuel. However, as shown by Muller direct type fuel cells comprising proton conducting electrolyte using water and dimethyl ether as fuel are well known in the art (col 3: In 38-52). As stated rationales in *KSR International v. Teleflex Inc.* (550 USPQ2d 1385):

- (a) Combining prior art elements according to known methods to yield predictable results;
- (b) Simple substitution of one known element for another to obtain predictable results;
- (c) Use of a known technique to improve similar devices, methods, or products in the same way;

- (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- (e) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (f) Known work in one field of endeavor may prompt variations of it for us in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (g) Some teaching, suggestion, or motivation to combine prior art references that would have led one of ordinary skill to modify the prior reference teachings to arrive at the claimed invention;

establish a prima facie case of obviousness. Therefore, it would have been obvious for the person of ordinary skills in the art at the time the invention was made to use direct dimethyl ether and water as fuels for fuel cell of PRAKASH as so is within the choice of the practitioner in the art and thought by prior art. The Examiner notes that above rationales are merely exemplary. For more information, see MPEP § 2141.

15. Claims 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lafitte et al. (Macromol, Rapid communications, 2002, 23, 896-900, hereafter referred to as LAFITTE, already of record) as applied to claims 1, 4-8, 12-14, 16 and 17 above, and further in view of Muller (US 6777116, hereafter referred to as MULLER).

With respect to claims 15 and 18, LAFITTE discloses direct methanol fuel cell (col 3: ln 28-32) but does not expressly disclose water alcohol having a carbon number

of 1-3 as the fuel. However, as shown by Muller direct type fuel cells comprising proton conducting electrolyte using water and dimethyl ether as fuel are well known in the art (col 3: ln 38-52). As stated rationales in *KSR International v. Teleflex Inc.* (550 USPQ2d 1385):

- (a) Combining prior art elements according to known methods to yield predictable results;
- (b) Simple substitution of one known element for another to obtain predictable results;
- (c) Use of a known technique to improve similar devices, methods, or products in the same way;
- (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- (e) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (f) Known work in one field of endeavor may prompt variations of it for us in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (g) Some teaching, suggestion, or motivation to combine prior art references that would have led one of ordinary skill to modify the prior reference teachings to arrive at the claimed invention;

establish a prima facie case of obviousness. Therefore, it would have been obvious for the person of ordinary skills in the art at the time the invention was made to use direct



dimethyl ether and water as fuels for fuel cell of LAFITTE as so is within the choice of the practitioner in the art and thought by prior art. The Examiner notes that above rationales are merely exemplary. For more information, see MPEP § 2141.

### ***Response to Arguments***

16. Applicant's arguments with respect to claims 1-8 and 10-18 have been considered but are moot in view of the new ground(s) of rejection.

With respect to prior art PRAKASH, the process of making of the solid polymer electrolyte in PRAKASH is similar to that of the present Application. The courts have held that "a compound and all its properties are mutually inseparable", *In re Papesch*, 315F.2d 381, 137 USPQ 42, 51 (CCPA 1963). Further, attention is drawn to MPEP 2112.01, which states that "products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present.", *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the examiner has maintained her position in rejecting the amended claims because the amount of unfreezable water is inherently within the range disclosed by the applicant (as in claim 1) if the polymer blends used in the prior art reference are comprised from the polymer compounds disclosed by the Applicant.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LADAN MOHADDES whose telephone number is (571)270-7742. The examiner can normally be reached on Monday to Thursday from 8:30 AM to 6:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LADAN MOHADDES/  
Examiner, Art Unit 1726

/Patrick Joseph Ryan/  
Supervisory Patent Examiner, Art Unit 1726